

ABSTRACT

Thesis: 100 pages, 20 figure, 7 tables, 49 references.

Objective: To study the influence on the amount of conductive filler composite conductivity and compaction pressure on porosity, structure and phase composition of ceramics based on Al₂O₃.

Methods: microstructural analysis, chemical analysis, measurement of electrical conductivity.

Subject of study: porous structure and phase composition of ultrafine powders sintered ceramic composition Al₂O₃ with carbon filler obtained using wet uniaxial compaction pressures in the range 50-250 MPa.

Scientific novelty: It is established that the addition of carbon nanotubes to ceramic materials rapidly increasing their electrical conductivity, which in turn allows us to provide a composite material conductive properties. With a low content of carbon nanotubes (1 - 2% wt.) Conductivity does not change and is about 5×10^{-8} S / cm. The increase of nanotubes to 5% by weight. leads to a sharp increase in the electrical conductivity of 3×10^{-4} S / cm.

Practical value: Small amounts of carbon nanotubes in ceramic matrix allow you to shoot electrostatic charges and increase the heat resistance of thermally unstable materials. Composites with carbon nanotubes can absorb and dissipate radio and as a result, can be the basis for a variety of devices.

Keywords: CERAMICS, ALUMINUM OXIDE, CARBON NANOTUBES, COMPOSITE MATERIALS, CONDUCTIVE PROPERTIES.